AMENDMENTS TO THE SPECIFICATION:

Please amend the specification as follows:

Amend the FOUR paragraphs from page 1, line 6 to page 2, line 16 to read as follows (including change of the section titles):

BACKGROUND ART

Zinc oxide is a material having electrically semiconductive, photoconductive and piezoelectric properties. There has been known a method for producing through a spattering or CVD process a zinc oxide material having suitable transparency and crystal-axis orientation for use as materials of piezoelectric or optoelectronics components (Japanese Patent Laid-Open Publication No. Hei 05-254991). A method has also been known for producing a transparent zinc oxide material having an electrically conductive or insulative property by doping zinc oxide of material with a doping material (Japanese Patent Laid-Open Publication No. Hei 05-070286). Further, a hydrothermal process has been known as a method for producing a piezoelectric semiconductor composed of a single crystal including zinc oxide as a primary component (Japanese Patent Laid-Open Publications No. Hei 06-279192, 06-279193, etc.). However, for such zinc oxide materials, it has not been reported to achieve a ferromagnetic state therein successfully.

DISCLOSURE OF INVENTION

Problems Solved By The Invention

Achieving a single-crystal ZnO thin film doped with Mn having a high ferromagnetic-transition temperature ~~enables~~ would enable providing optical isolators or high-density magnetic

recording medium capable of transmitting larger amount of information, and ~~makes~~ would make it possible to fabricate a desirable electronic industry material required for oncoming large-scale information transmission. ZnO also has a large band gap of 3.3 eV. This opens the way to fabricate a light-transmittable ferromagnetic material, which may facilitate the extensive evolution of manufacturing technologies for optical devices, such as a photon computer utilizing a coherent spin state.

For achieving a ferromagnetic state with a high ferromagnetic-transition temperature by doping Mn into ZnO, it is required to heavily dope a hole (p-type carrier) having an interactional function for ferromagnetically uniform the spin in Mn doped into ZnO being a wide-gap semiconductor.

~~DISCLOSURE OF INVENTION~~

Means For Solving The Problems

In order to achieve the above object, the inventors have successfully developed a new method for controlling valence electron based on doping a p-type dopant by itself or codoping a p-type dopant and an n-type dopant, so as to ferromagnetically uniform the spin in Mn doped into ZnO, by utilizing an energy gain arising from itinerant kinetic-energy of the hole doped at a high concentration.